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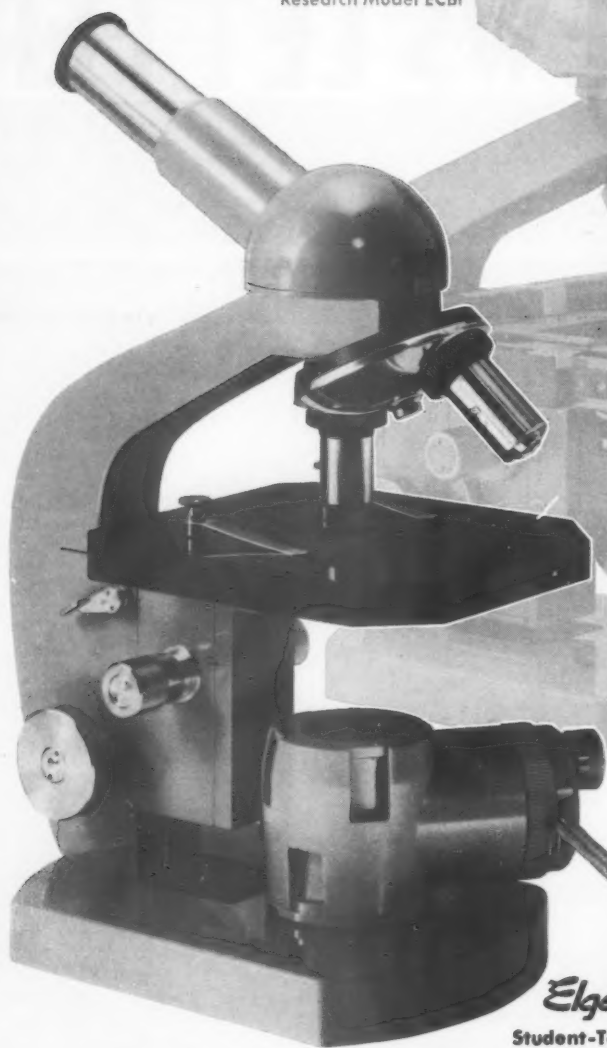
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GEOPHYSICS

Heating Rocks Gives Age

Radioactivity, displayed in prehistoric objects as thermoluminescence, now dates civilizations up to about 100,000 years. This technique supplements the carbon 14 method.

A METHOD of dating the age of past civilizations based on heating their rocks and pottery is now available to help the historian and archaeologist.

Thermoluminescence, caused by radioactivity in all sorts of materials and displayed when they are heated, is the basis of the new method.

Announced to the American Association for the Advancement of Science in Chicago by Drs. George C. Kennedy and Leon Knopoff of the University of California Institute of Geophysics at Los Angeles, the method is extremely simple and speedy.

The material, usually pottery or lava, is heated to below the point where it gives off light itself. This releases thermoluminescence, which is caused by electrons being freed from the solids in which they have been trapped for the many years.

All materials contain traces of radioactive elements. Over the years this radioactivity

decays, giving off alpha and beta particles which trap electrons in solid crystals. The older the material, the more electrons are trapped.

When the material is heated up to about 350 degrees centigrade or less, the electrons are given back and create a mild light that can be captured by a photomultiplier tube. The more light, the older the material is.

The method is good for about 100,000 years in the past and it therefore supplements beautifully the dating of ancient civilizations by carbon isotope 14 which has been so successful for samples up to 40,000 years old. Dr. Knopoff, in presenting the paper, told of dating 16 fragments of ancient Athenian pottery, dishes, lamps, cups, vases and wine jugs, which were known to have come down from the Ninth Century B.C.

The thermoluminescence method checked with the historical date. Lava rocks from

northern Arizona were dated back to 15,000 years ago.

It is expected that this new method will be particularly significant when used on Mayan and Mexican pottery, and it should solve the puzzle of the Mayan calendar. The method has been tied in with the dates in the Southwest determined by the study of tree rings and it will make possible a wide extension of the times at which early American civilization existed.

The new method is especially useful for civilizations which have left their records, not in wood and charcoal, containing carbon, but in their distinctive pottery.

Many of the past records have undoubtedly been lost because of the decay and rot of wood or the fact that later civilizations burned the records of the previous civilizations, which might otherwise have been dated from the tree rings or by the carbon-14 dating method.

Science News Letter, January 16, 1960

GENERAL SCIENCE

Study Urged for U. S. Science Council

THERE SHOULD BE careful consideration of the organization of science in the academic, industrial and Government areas of the nation, and a commission should be formed to study the problem, Dr. Wallace R. Brode declared at the Chicago meeting of the American Association for the Advancement of Science, speaking as retiring president. Dr. Brode is science adviser to the Secretary of State, but he stressed that the ideas presented were strictly personal ones.

Dr. Brode recommended study of the following concepts:

a. There should be a regrouping of some of the Government's scientific agencies or activities: a Department of Science, National Science Institute or other coordinated organization. A well-developed coordination must be established between the regrouped combination and those scientific agencies which remain separate so as to insure an efficient and comprehensive National Science Program.

b. There should be a realignment of the distribution methods and responsibility for support of basic research in our educational institutions with a movement toward university grants, administered largely by a basic Department rather than applied agencies. This may need to be coordinated with the growing problem of the support to our advanced education program in all areas.

c. There should be some separation of Governmentally-sponsored major research institutions from our educational and industrial system, especially those institutions which are essentially applied science. There should be a greater acceptance of operation of such institutions under an improved direct Government administration.

d. The liaison of Government scientists with the academic and industry scientists should be represented by a "National Science Council" in such a manner as to be compatible with the maintenance of our broad culture and balanced development.

Science News Letter, January 16, 1960



TROPO SCATTER—A multi-channel voice transmission system links three Libyan cities on the Mediterranean. Antennas beam voice signals from long distance telephone conversations to the troposphere six to 12 miles above the earth. The signals are then reflected back as far as hundreds of miles from their starting points. The tropo scatter system is easier to install and maintain than other transmission systems.

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ROCKETS AND MISSILES

1959 Space Score: 11 to 3, U. S. Favor

AT THE END of the 12th inning of 1959, the space score stood 11 to 3, in favor of the U. S.

In 1959 Russia launched only three space experiments successfully. But all were spectacular when viewed from anybody's grandstand.

With Lunik I, Russia orbited 794 pounds of scientific instruments that swept past the moon and went into a 15-month orbit around the sun. With Lunik II, the Soviet Union became the first nation to put personal property on the moon. Someday an exploring party may find Russian-made metal emblems scattered about the Sea of Tranquility. With Lunik III, Russia demonstrated championship guidance technique by boomeranging a satellite around the moon and taking the first picture of the moon's previously unseen side.

The U. S. played less spectacular space ball but batted in more runs:

1. Successful launching of six Discoverer satellites aimed at sustaining biological life in space and developing practical recovery techniques.

2. Successful launching of two Vanguard rockets for studying the earth's cloud cover, magnetic field, solar X-rays and conditions in space.

3. Successful launching of two Explorer satellites measuring earth radiation, cloud cover, magnetic fields, behavior of radio waves, earth's radiation balance, hazards of meteors and space temperatures.

4. Successful launching of Pioneer IV, now orbiting the sun and measuring radiation in space.

Science News Letter, January 16, 1960

BIOLOGY

Russians Raise Ostriches For Food and Feathers

THE AMERICAN ostrich appears to be doing well in Russia. In fact, a flock has adjusted so well to the climate that researchers there believe the birds can provide edible and nutritious meat, large eggs and ornamental feathers.

The Nandu or *Rhea americana* as the bird is scientifically named, is being raised in Askanya-Nova—in the Ukrainian part of Russia—report A. A. Salgansky and L. A. Salganskaya. In winter they are confined, but let out in enclosed pastures for the rest of the year. The pasturing period is about 175 days long, with grain making up the major part of their feed.

The number of eggs ranges from 16 to 24, with an average weight of 500 grams or 17 ounces. The young chicks appear to grow rapidly in their Russian home. They grow accustomed to caretakers, are easy to herd, move about and weigh. The weight of chicks at hatching averages 400 grams. At four months of age their average weight increases to five kilograms.

One problem faced by the Russian researchers, and reported in the journal *Priroda*, a semi-popular magazine published by the U.S.S.R. Academy of Science, is the effect of inbreeding.

Low-fertility, low viability of eggs, lowered vitality of young, and greater number and variety of deformities are some of the effects of close inbreeding. It is desirable to bring in outside blood for the flock, the Russians suggest. These could be brought in either from the ostriches' native land in South American tropical jungles or from European zoos.

The researchers also point out that building up a flock of the ostriches, now rare in South America, may save the bird from extinction. They recommend construction of a special farm for semidomesticated maintenance of the Nandu.

Science News Letter, January 16, 1960

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ARCHAEOLOGY

Feet Give Clue to Statue

THE MISSING FEET of a Greek marble victory statue has helped identify it as the life-size copy of one which once stood poised on the hand of the giant statue of the goddess Athena in the Parthenon.

The statue, called a Victory, or Nike, because of its now missing wings, is a mere fragment, consisting of a body draped in the typical, Greek loose garment known as a peplos. The head, wings, arms and feet that had once been made separately and attached are all missing.

The Nike had been on display in the University Museum, University of Pennsylvania, Philadelphia, for several years without ever having been exactly identified. When it was removed from its mounting for a new arrangement in the Classical Gallery of the Museum, a previously unnoticed detail was discovered: a hollowed out space on the bottom of the centerblock under the missing feet of the statue. Apparently the statue originally had not been

mounted in the ordinary manner but elevated on some sort of support. It might have been lifted aloft as if the Nike were flying or floating in the air. This was also indicated by the statue's flowing robes, yet, examination of the statue showed that the wings had not been spread for flight but folded.

It was also evident that the left arm had been raised and the right arm lowered. In addition, since so little of the missing feet would have shown from under the robe because of the supporting block, it was puzzling that they had been attached and not cut directly out of the marble block itself. The answer had to be that they were made of a material other than marble.

Traces of vermilion color noticeable on the figure of the Nike established she was at one time gilded, a much-used practice in ancient times. The vermilion traces are actually cinnabar, or red sulfide of mercury, used in antiquity as a binding medium in gilding.

The gilded gown hinted that the Nike had been a copy of a gold statue, one most likely having ivory head, arms and feet. This combination was commonly used in Golden Age Greece in the fifth and fourth centuries B.C. for statues of Greek gods and goddesses.

It was also a common practice to copy the most famous and costly statuary in cheaper materials such as marble. The missing limbs of the copy could very likely have been made of alabaster and the wings of wooden sheets or plaster instead of ivory.

The Nike has for a long time been associated with the Elgin marble sculptures from the Parthenon, temple of Athena, due to the similarity of style. According to Dr. Rhys Carpenter, professor emeritus of classical archaeology at Bryn Mawr College, who made the identification of the Nike and reports it in *Expedition* (2, 34, Fall, 1959), the close similarity of the Nike with the Parthenon sculptures dates it at about the same time, around 440 B.C.

Dr. Carpenter concludes that the only possible source for a Nike of this period is

the gold and ivory Nike on the outstretched hand of the 40-foot Athena in the Parthenon on the Acropolis, the religious city of ancient Greece. This is also substantiated by a coin of the fourth century B.C. from the city Aphrodisia in Asia Minor. The coin depicts a miniature version of the statue of Athena, holding on her outstretched hand the symbolic figure of a Victory statue with wings closed on the back and an olive branch suspended between her raised left and her lowered right hand.

Science News Letter, January 16, 1960

ASTRONOMY

Comet Found in Southern Sky

A NEW COMET, the first to be reported in 1960, has been discovered in the southern sky. The object has been named Comet Burnham after its discoverer, Robert Burnham of Prescott, Ariz., who found it while working at Lowell Observatory, Flagstaff, Ariz. Mr. Burnham also spotted the first comet of 1958.

Mr. Burnham discovered the comet on Dec. 30, then photographed it again on Jan. 2. It is too faint to be seen directly, even with telescopic aid.

News of the comet's discovery was reported to astronomers by Harvard College Observatory, Cambridge, Mass., clearing house for astronomical information in the Western Hemisphere. Comet Burnham's position in the constellation of Pisces, the fishes, was calculated by H. L. Giclas at Lowell Observatory.

Science News Letter, January 16, 1960

ENGINEERING

Powdered Cores Reduced More Than 200 Times

See Front Cover

CORES for filters used in transmitting information from missiles, satellites and other electronic equipment are getting smaller and more efficient at the same time.

These cores are made of molybdenum permalloy powder compressed under high pressure and subjected to high temperatures.

Over a period of years, the weight of the cores, as shown in the photograph on the cover of this week's SCIENCE NEWS LETTER, have been reduced from four and a quarter pounds to one-third of an ounce.

Systems using these core filters, can relay information as to altitude, direction, pressure, radiation and presence of gases in the stratosphere or ionosphere, and several messages can be received over the same wire. As each system requires 23 filters, the weight saving with the reduction in core sizes has been very great.

The cores are the working parts of the filters. They are made by Arnold Engineering Company, a subsidiary of the Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Science News Letter, January 16, 1960



NIKE AND COIN—The marble Nike, or victory statue, above, is a copy of the one the goddess Athena holds in her hand on the coin to the right. The missing feet of the statue led to its identification with the original Athena victory in the Parthenon temple on the ancient Acropolis, or religious high city, of the Greeks.



PUBLIC HEALTH

USSR Health Services Free

ALTHOUGH the general quality of medical care in Russia today falls far below that of the United States, almost every Russian citizen can take advantage of it because it does not cost a red cent.

This is one of the conclusions Drs. Thomas Parran, Otis L. Anderson and Henry VanZile Hyde, all of the U. S. Public Health Service, Dr. Malcolm Merrill, director of California's Public Health Department, and Dr. Leonid S. Snegireff, associate professor of cancer control, Harvard School of Public Health, made after returning from a tour of the medical and public health facilities of several Soviet Republics. Their report appears in the *New Physician* (Jan.).

The Iron Curtain patient has little or no freedom of choice of a physician. In addition, physicians have little voice in the final location of their practice, the visitors reported.

They found that tuberculosis is more widespread in the U.S.S.R. than in the U. S. and that the streets of the larger cities revealed alcoholism to be an obvious problem. In contrast, Soviet health museums emphasize alcoholism as a problem of capitalism.

The health of industrial workers ap-

peared to be well cared for in large industrial plants. The U. S. health officials found that such workers were provided with extensive medical care services and general hospitals. One such industrial example was a large automobile plant employing between 35,000 and 40,000 workers. An automobile called a Ziss, identical in appearance to a 1941 Packard, is produced at the plant.

Various methods of birth control are available to every citizen, the visitors found. Information on contraception is available upon request and contraceptive devices can be purchased from pharmacies on a physician's prescription. The Russian citizen receives birth control education through lectures, pamphlets and motion pictures, many of which stress the prevention of pregnancy rather than abortion.

Other conclusions the group listed included: low standard of living conditions compared with the U. S. and Western Europe; new construction is unattractive; public markets are relatively clean; health departments are taking an active part in city planning from the standpoint of sanitation and health facilities.

Science News Letter, January 16, 1960

GENETICS

Heredity Took Spotlight

MAN'S HEREDITY stole the spotlight in medical research of 1959, the deans of 84 medical schools agreed.

Scientists have learned a great deal in the past year about the chemistry of genetics. Dr. William S. Stone, dean of the University of Maryland School of Medicine, said that he considers this aspect of genetics to be the biggest single achievement in the field of scientific medicine in 1959. The deans were polled by the American Medical Association on what they thought were the greatest medical achievements during the year.

Many biochemical geneticists, including Nobel Prize winners, are looking to the day when man can plan himself, and draft and carry out plans to improve the species as to intelligence, physique and disease resistance.

Another achievement of the past year in biochemistry has been a better understanding of the inhibition of nerve impulses and the relation of such chemistry to epileptic seizures, which has led to some revolutionary thinking. This opinion was expressed by Dean Stafford L. Warren of the University of California Medical Center, Los Angeles. Significant contributions have also been made to fundamental knowledge of the learning process, he reported.

Researchers at that California Medical Center have been able to trace records of the learning process on a brain-wave detecting device. Such basic learning, he

said, may eventually mean a better understanding of the nation's major problem of mental health and bring about better methods of treatment.

The Nobel Prize winners in medicine for 1959 are Drs. Severo Ochoa of the New York College of Medicine and Arthur Kornberg of Stanford University. Both have contributed much to biochemical genetics.

Their discoveries relate to the biological synthesis of the important life compounds called DNA (deoxyribonucleic acid) and RNA (ribonucleic acid). DNA is believed to be the chemical that passes on hereditary information from one generation to another. RNA is a key substance in the production of protein.

Science News Letter, January 16, 1960

PUBLIC HEALTH

AMA Charges Food Scare Caused Undue Alarm

THE AMERICAN Medical Association strongly criticized the Federal Government for its recent pronouncement concerning cranberries, capons and charcoal.

The Government's scientific data and the law pertaining to cranberries, charcoal and chickens caused undue alarm among the American people, Dr. John H. Talbot charges in an editorial in the *Journal of the American Medical Association* (Jan. 2).

Aminotriazole was the dangerous, cancer-

causing herbicide which caused the Government to impound the nation's cranberry supply shortly before Thanksgiving.

Little stress was placed on the fact that the antithyroid action of aminotriazole is described in current text books of therapy, he points out in the editorial.

Chickens were under suspicion for only a few days in December, he says. However, neither poultry producers, manufacturing chemists, nor the chickens themselves had violated any Federal regulation. Approximately one percent of the chickens eaten in the United States have been given stilbestrol as a fattening hormone. The implantation of this pellet in chickens has been an authorized practice for more than a decade, he reports. Recent improved tests revealed that residues of the drug remained in the skin, liver and kidneys. After this discovery, immediate steps were taken to withdraw the caponettes from commerce and to suspend the sale of stilbestrol to chicken growers.

Charcoal (carbon black) is used to color licorice and black jelly beans. This food additive was listed in the Federal Registry more than one year ago as permissible for human consumption.

Its omission from the Registry in 1959 brought apprehension to the makers of licorice candy and black jelly beans. Later, a supplementary document by the Food and Drug Administration permitted processors and users of charcoal in food and candies a three-month period of grace to produce evidence that burned toast (presumably the carbon formed) is harmless, he said.

Science News Letter, January 16, 1960

MEDICINE

Children With Artificial Limbs Do Normal Acts

MOST CHILDREN handicapped by the loss of an arm or leg can become nearly as independent as other boys and girls, the chief of the Federal Government's Children's Bureau reports.

The artificial arms and legs now available can be fitted on youngsters. When these boys and girls are properly trained to use them, they can perform most functions, Katherine B. Oettinger explains in a new pamphlet, "The Child With a Missing Arm or Leg."

The past history of the development of artificial limbs centers around rapid adaptations of devices developed for veterans of World War II. The pamphlet points out that there are various kinds of prosthetic devices available. In addition to the adult-sized hand already on the market for both men and women, a child's hand is now being tested prior to being put in general use.

The Federal Government pamphlet offers parents of handicapped children these tips: fit and train the child to his prosthesis as soon as possible, the earlier the better; do not blame anyone for the child's defect; encourage him to participate in activities with normal children; do not "baby" the handicapped.

Science News Letter, January 16, 1960

TECHNOLOGY

Promises Due for 1960's

Synthetic foods, new building materials, remote-controlled highways and automatic mailing expected in the 60's. Weed-killers injected into soil instead of sprayed on plants.

PLASTIC HOUSES, picture-on-the-wall TV, high-speed cooking and foods made of chemicals are only a few of the triumphs expected to come during the 1960's.

A survey of scientific sources indicates vigorous, startling changes are in store for Americans. Some are already on the way.

During the 1960's, housewives will be able to buy more dehydrated foods requiring no refrigeration, such as powdered tomato juice. Also expected are laboratory-made foods, consisting only of common chemicals, which will be palatable and have nutritional value. Such synthetic foods will be used widely to relieve the serious world shortage of food.

Coming also will be new and improved fabrics for clothes, including men's winter business suits made of wool that can be washed at home. Significant strides already have been made in creasing wool permanently and giving it resistance to moths and rot. Perfection of a treatment to make cot-

ton fibers repel grit and dirt particles means expanded use of cotton, especially in wash-at-home rugs.

The promise of plastics as a house-building material will be developed, and houses of the late 1960's may have new and interesting shapes. Gabled roofs will begin to give way to domes made of plastics or thin-shell concrete. The box-like design of today's typical house may be replaced by sweeping geometric curves designed to "squeeze the most living" out of floor space.

In house design, greater attention will be devoted to colors, textures and acoustics. Today's slick, cold, formal plaster wall will yield to "cozier" surfaces having the feel and appearance of rich fabrics. Whole ceilings or walls will glow with electroluminescent light to replace inefficient, dirt-catching chandeliers.

Central air-conditioning will be common in new houses, and house heating using the sun's rays will be making inroads on con-

ventional systems. Kitchens will have infrared or high-frequency electronic ovens to cook heavy roasts in minutes.

Radical construction techniques will be used to meet the skyrocketing demand for houses. Strong epoxy resins that can glue steel to glass will replace nails in many cases, giving faster construction and tighter joints with fewer materials. Aluminum will be used structurally as well as decoratively. Lumber will be glued together in laminations for less warpage. Whole panels of prefabricated brick wall will be available for quick erection.

Other prefab walls will be made of plastic having a colorfast, weather-resistant outside, a decorative finish on the inside and good insulation stuffed in between.

Picture-on-the-wall TV will be achieved, along with world-wide television broadcasting, perhaps using earth-circling satellites to relay programs from one continent to another. Broadcasting in stereo, using FM to carry both sound channels on one frequency, will be achieved.

More Frequencies Needed

Some presently unknown technique—a real breakthrough—is expected that will effectively make more radio frequencies available for commercial, amateur and scientific purposes.

To handle the volume of mail, the U. S. Post Office will become completely automatic. Letters will be opened by machine, transmitted in the handwriting of the writer to the destinations by radio and folded and sealed by machine into an envelope for delivery. Secrecy of the mails thus will be preserved.

On farms, electrically operated materials-handling equipment will come into wide use. Automatic harvesting is near, with machines promising to relieve the farmer of heavy manual labor in barn-cleaning and handling feeds on dairy, poultry and livestock farms.

Emphasis on insect control will turn from the chemical bug-killers of cranberry fame to biological controls—like the milky spore disease that kills Japanese beetles. Other chemicals, injected into the soil, will be taken up by plants to make them insect-resistant.

Industry will intensively exploit automation. Computers will design other computers. Machines will translate at 2½ cents a word from a foreign language into English. Others will do a literature look-up job in five seconds that would take a man three months.

Salt water of the oceans will be converted to fresh and pumped through long pipelines to where needed, perhaps with nuclear energy driving the huge pumps. Metals will be custom designed to fit any job by adding impurities or controlling dislocations in the molecular lattice structures.

Also the 1960's will see the beginnings of remote-controlled traffic highways. Doctors will use electronic machines more extensively for precise diagnoses.

These are but a few of the major advances expected in the exciting ten new years now on the way.

Science News Letter, January 16, 1960



MOUSETRONAUTS—Two tiny white mice live in a sealed-off glass and plastic world to aid space medicine. Connected to the mouse jar by a system of pumps is a fluorescent-lighted plastic tank which holds about four quarts of algae and water. This mixture provides oxygen for the mice while the mice supply carbon dioxide for the plants. This closed system has previously been tested up to 292 hours with one of the mice. So far the mice have been fed laboratory food in pellet form, but later they will be fed algae from the tank. Dr. Russel O. Bowman, research scientist in biotechnology in Vought's Research Division, believes that algae offer the greatest potential as an all-round food for man in space. Algae can be grown on the trip to the moon or Mars and can be treated to taste like steak, roast beef, fish, coffee, tea, desserts, and dried they make green cornflakes.

ASTRONAUTICS

**Men to Mars Possible
In 60's, Experts Say**

THE UNITED STATES will be able to send three men on a 14-month expedition to Mars in a nuclear-powered two-stage rocket ship during the 1960's, three space experts assert.

The rocket ship would go into orbit around Mars, and the exploring party would use a chemically propelled "taxi" to go down for a close look at the Martian landscape. After exploring for two months, the party would refuel their orbiting space ship and head back to earth.

Tanks of hydrogen, for refueling purposes, would be launched about a month earlier than the manned ship to make certain they are on course and that the hydrogen will be available on Mars. These tanks, taking a slower, easier path, would arrive at Mars after the manned ship. Three tankers each carrying 88,000 pounds of propellant could provide enough fuel for the return flight.

In addition to its three-man crew, the space ship would carry 55,000 pounds in life-support materials, plus the fueled chemical rocket for surface exploration. Food and water alone would weigh 19,000 pounds.

Feasibility of such an adventure was ascertained by M. W. Hunter, assistant chief engineer of space systems, E. B. Koeneck, chief of life sciences, and R. F. Trapp, nuclear engineer, all of Douglas Aircraft Company of Santa Monica, Calif. Full details are reported in *Aero-Space Engineering*, published by the Institute of the Aeronautical Sciences, New York.

Science News Letter, January 16, 1960

MEDICINE

**Ulcer Patient May Face
Post-Surgery Anemia**

THE ULCER patient may be wheeled from the operating room straight into new trouble—iron deficiency anemia.

It has long been known that the upper gastrointestinal tract has the body's greatest capacity for iron absorption. When all or part of the stomach is removed, the patient's ability to maintain an adequate iron supply is reduced, a report in *Nutrition Reviews* shows.

Even when only a small part of the stomach has been removed, there can be difficulty: the entire digestive system may go into an abnormally high-speed cycle. The remaining portion of the stomach has less than an adequate chance to absorb iron.

One reason is that the meal passes swiftly through the stomach, which acts as little more than a temporary cul-de-sac in a continuous passage. Or, some patients, bothered by rapid elimination, will tend to cut down on the amount of food they eat.

Even iron pills work less effectively on ulcer patients who have undergone surgery. The overly fast functioning of the digestive system reduces the effectiveness of iron pills given to persons without stomachs.

Normal or near normal utilization of the pills was found to be possible, however, when the patient consumed the pill while lying down.

Posture, speed of the digestive process and the quantity of food intake do not tell the entire story, however. Some persons suffering anemia who have undergone stomach excisions are found to eat an entirely adequate amount of iron and show no signs of hasty digestion.

Using atomic isotopes of iron as "tracers," recent investigators have found that some of these patients just do not have the ability to absorb iron from their food. The problem can be met successfully, however, by consuming inorganic iron in a soluble form. Even among persons who have lost all of their stomach, iron in this form is adequately assimilated.

Science News Letter, January 16, 1960

ASTRONOMY

**Age of the Universe
May Be 24 Billion Years**

A STAR CLUSTER 18 billion miles away, appears to be about 24 billion years old—or twice as old as previously believed.

Astronomers are not yet sure that the estimate is correct. If it is, the age of the universe, now thought to be some ten billion years old, will be more than doubled.

The star cluster, part of the Milky Way galaxy, is located in the direction of the North Star. Many of its stars are pretty well burned out. It was estimated that about 18% of the hydrogen in its stars is gone while the sun, believed to be five billion years old, has only lost about five percent of its hydrogen.

Dr. Allan Sandage, astronomer of Mt. Palomar and Mt. Wilson Observatories, reported his observations at the meeting of the American Physical Society in Pasadena, Calif. He studied the cluster, named NGC 188, with the 200-inch Mt. Palomar telescope and the 60-inch at Mt. Wilson.

Science News Letter, January 16, 1960

AGRICULTURE

**Sodium Mixture Plus
Sewage Make Herbicide**

SEWAGE can be turned into an effective weed killer, a team of Russian researchers report.

Sodium thiocyanate added to industrial sewage caused complete destruction of plants in areas with a dense weed cover in about two to three weeks. Horse sorrel, dandelion, plantain and lady's mantle were most sensitive to the herbicide, B. Ya. Sigalov, Yu. M. Prokhorova and I. M. Gracheva found.

Grainy hair grass and annular meadow grass were more resistant, they report in *Scientific Information Report* (Dec. 4, 1959), which contains translations from Russian science journals prepared by the Central Intelligence Agency. The herbicide also acts on weed seeds, trees and brush wood.

The Department of Commerce distributes the *Scientific Information Report*.

Science News Letter, January 16, 1960

IN SCIENCE

PHYSICS

**Liquid Used for Cosmetics
Valuable in Physics**

A LIQUID originally designed as a base for cosmetics is proving very useful to physicists trying to detect the various particles given off by exploding atoms.

Most liquids that give off tiny light flashes, or scintillations, when bombarded by nuclear particles are hazardous if used in large volumes, as is sometimes necessary. Some of them also dissolve their Lucite container, used because it is transparent and easily shaped.

To overcome these difficulties, Drs. H. A. Miranda Jr. and H. Schimmel of Columbia University's Hudson Laboratories, Dobbs Ferry, N. Y., investigated other liquids for use as a scintillator. They found that Dow Corning Silicone-555 fits the requirements. It is water-clear and does not affect Lucite even after prolonged contact, they report in the *Review of Scientific Instruments* (Dec., 1959). The most suitable mixture is four grams of 2,5-diphenylotaxazole plus 100 grams of naphthalene for each liter of Silicone-555 fluid.

Science News Letter, January 16, 1960

GEOPHYSICS

**Russian Glaciers Confirm
Climate Warming Trend**

A RUSSIAN scientist has confirmed the suspected warming trend of the world's climate by measurements of retreating glaciers and ice formation.

The duration of the ice period on Lake Kallavesi in Finland and on the Neva and Western Dvina rivers is two to three weeks shorter in this century than it was during the preceding 200-year period, he found.

Positions of the glaciers of Gergeti, Yugo-Vostochnyy, Belengi and others located in the central and eastern portions of the main Caucasus range have been measured since 1911. By analyzing these positions, he learned that the speed of the glaciers' retreat is greater in recent years than in the preceding period. Especially large changes in the retreat speed began in 1930, some three times those of the previous years.

Measurements have also shown that the rise in the snow line on the slopes of the mountains of Kazbegi has increased three to four times during the last 100 years.

Other Caucasian glaciers show the same changes in snow line, B. Sh. Tsomaya of Moscow reports. His results appear in *Information on Soviet Bloc International Geophysical Cooperation—1959*, a translation of Russian scientific journals distributed by the U. S. Department of Commerce.

Science News Letter, January 16, 1960

ENE FIELDS

PHYSICS

Year-Long Tests Confirm Einstein's Theory

YEAR-LONG tests, believed the most precise yet made, have confirmed preliminary results by the same method that Einstein's special theory of relativity is correct.

The experiments showed no measurable variation in frequency of radio waves radiated by ammonia molecules as the earth moved around the sun during a year. Einstein's special theory postulated that the velocity of light, 186,000 miles a second, is independent of its frame of reference or of the motion of the light source itself. It also applies to radio waves, which travel at the speed of light.

Results of the experiments, conducted at Columbia University at the suggestion of Nobel Prize winner Dr. Charles H. Townes, are reported in *Nature*. His associates found that, at most, less than one-thousandth of the earth's velocity around the sun could affect the speed of light propagation.

High precision of the tests was possible by using two masers. The coined word maser stands for "microwave amplification by stimulated emission of radiation." Previous experiments, starting with the classic Michelson-Morley tests, have confirmed Einstein's theory but not as precisely as the present test.

Science News Letter, January 16, 1960

MEDICINE

Low Cholesterol Levels Found in Atherosclerotics

THE FINGER of guilt usually pointed at high cholesterol levels as a cause of atherosclerosis has been nudged aside.

Three Canadian scientists collected information for this controversial medical puzzle from 1953 to April, 1959, consisting of serum cholesterol measurements of 800 older patients. Autopsies on 191 in the group revealed that atherosclerosis occurred as frequently in patients with low cholesterol levels, 150-199 milligrams percent, as in those with moderately high levels, 250-299 milligrams percent.

The researchers found that the severity of atherosclerosis is not directly proportional to the cholesterol levels of the 191 fatalities examined. In addition, they found the complications of this artery-clogging disease occurred as frequently in patients with low as well as moderately high cholesterol levels.

The investigators examined patients between the ages of 50 and 89, mainly. They did concede, however, that there might be a relationship between the severity of atherosclerosis and cholesterol level when it exceeds 300 milligrams per-

cent, a figure most doctors would agree is too high.

Atherosclerosis is a form of arteriosclerosis, the general name for hardening and thickening of the walls of the arteries. When atherosclerosis occurs, fat-like deposits build up along the walls of the arteries. Eventually, the artery becomes completely filled by this deposit, preventing blood flow. Doctors have noticed that many persons who were victims of atherosclerosis also had high cholesterol levels. Cholesterol is a major ingredient in the fat-like substance that is deposited along the artery's walls.

The scientists, whose article appears in the *Canadian Medical Journal* (Jan. 2), are Drs. J. C. Paterson and E. C. Armstrong, and Lucy Dyer, of the Westminster Hospital and the Collip Medical Research Laboratory, University of Western Ontario, London, Canada.

Science News Letter, January 16, 1960

PSYCHOLOGY

Studies Show Democracy Begins at Home

DEMOCRACY begins at home should be the guide for the American family, a psychiatrist reported to the American Association for the Advancement of Science in Chicago.

A "touch of chaos" seems to have been introduced into American families by confusion as to the different roles of family members and by the "uncertainty of many psychologists about the structure of the family," said Dr. N. S. Lehrman of the Albert Einstein College of Medicine.

The anarchic family is partly a result of psychological and psychoanalytic teachings, he claimed. The parents, frightened of frightening their children, often blur or even reverse the basic authority role relationships within the family.

In the democratic family, however, the different roles are clearly defined while the right to peacefully dissent is maintained. The right to dissent is not confused with the responsibility for decisions, Dr. Lehrman emphasized. Responsibilities begin on parental shoulders and are passed on to the children only as they give signs of being able to assume them.

Science News Letter, January 16, 1960

BIOLOGY

Malayan Mosquitoes Steal From Bigger Ants

CERTAIN MALAYAN mosquitoes obtain their entire sustenance from what they steal from ants twice their size.

Described in a report by the Smithsonian Institution, Washington, D. C., these mosquito pirates are much smaller than ordinary ants. Sitting on branches inhabited by ants, the tiny mosquitoes thrust their proboscises between the open mandibles of ants that run through their legs. In this way, they steal the ants' nectar for their own dinner.

Science News Letter, January 16, 1960

STATISTICS

Farm Lads, Lassies Start Drinking in the City

A SURVEY of the drinking practices of 1,185 adults in Iowa reveals that the prevalence of drinking increases among persons raised on farms when they move to the city.

In Iowa, approximately half of the farm residents drink as compared to about two-thirds of the city dwellers, Dr. Harold A. Mulford and Donald E. Miller of the State University of Iowa explain in the *Quarterly Journal of Studies on Alcohol* (Dec., 1959).

Sixty-six percent of city residents, 55% of town residents and 49% of the farm population classified themselves as users of alcohol. The farm-reared group who had migrated to cities demonstrated an urban prevalence for drinking rather than a rural one.

In addition, the highest prevalence rate, 63%, occurred among the college educated, compared with 51% of those with only grade-school education.

The evidence appears to point to some increase in the prevalence of drinking in the future as more Iowans become city dwellers and acquire more education than their parents, the men say.

Science News Letter, January 16, 1960

BIOLOGY

Foreign Moth Imported To Fight Toxic Weed

AN IMPORTED INSECT, the cinnabar moth, has been released along the West Coast in an attempt to control a weed currently threatening horses and cattle.

The moth feeds on tansy ragwort in Europe and Great Britain, U. S. Department of Agriculture researcher James K. Holloway reported. Insect larvae were released in California, Oregon and Washington where there are heavy infestations of the weed. It is hoped the moth will emerge in the spring at the time tansy ragwort plants are starting to form flower buds.

The toxic weed competes with valuable range grasses and is spreading over more land each year. Chemical control is often not economically feasible, the Department of Agriculture reported.

Tests conducted by entomologist Harry Parker at the Department's Parasite Introduction Laboratory, Paris, France, showed the cinnabar moth "has no liking for any useful plants." The moth larvae also will not feed on safflower, a relative of tansy ragwort that is grown as a commercial oilseed crop.

Adult moths emerge in early spring and the females lay their eggs on the underside of the weed's leaves. Larvae feed on the foliage and young buds.

Although the cinnabar moth is not expected to eliminate tansy ragwort completely, it should keep it controlled to the point where the weed no longer causes economic stress.

Science News Letter, January 16, 1960

TECHNOLOGY

Fuel Cells to Run Electric Cars

Electric cars, buses, trains and submarines may use a revolutionary source of electricity in the near future. Fuel cells promise to generate electricity directly from chemicals.

By ALLEN LONG

ELECTRIC AUTOMOBILES far superior to the runabouts of grandma's day may be on the way back to the American market. Quietly operating without the putt-putt of a bad muffler or the gnashing of gears, the electric cars will have a new heart tucked away in their chrome-plated bodies.

This new heart will be a fuel cell—a revolutionary device for generating electricity directly from chemicals at an efficiency that even beats the biggest, fanciest power house in the world. Instead of driving into a filling station for a tank of gasoline, you may instead drive in and ask for a "ball" of hydrogen.

As long as the fuel cell is supplied with its basic chemicals, it silently and efficiently generates electricity. Unlike conventional batteries now found under hoods, the fuel cell does not require electrical recharging. When the fuel cell's chemicals react, free electrons are released and can be made to circulate in an electric circuit.

Dr. Herman A. Liebhafsky of the General Electric Research Laboratory says the electric car could be here in five years.

Chrysler Corporation's DeSoto division already has started work on the Cella I, which it calls an "idea car" for the exploration of advanced engineering concepts. DeSoto hopes to perfect this fuel-cell car "within the next generation."

Buses, Trucks and Trains

The car likely will have an individual electric motor driving each wheel. The motors will be connected in a circuit that obviates differential gears, yet allows one wheel to turn a little faster than another on curves, but with a safeguard against spinning a wheel at high speed in a ditch or an icy road.

But the private passenger car is not the only vehicle that fuel cells may power in the future. Far-seeing scientists and engineers foretell use of fuel cells for powering city buses, trucks, trains, communications gear and satellite instruments. A submarine running on fuel cells could cruise for long periods underwater but would have more quiet stealth than one running on nuclear power.

Resembling a big battery, the fuel cell could offer these advantages when used in cars: No smog-producing chemicals exhausted; silent operation; more miles per penny because of its 65% to 80% efficiency in making electricity, particularly at traffic speeds; no fuel used when the car is stopped in a traffic jam.

All this may sound extraordinarily optimistic—and indeed some hurdles remain

to be leaped before these goals can be attained. But remember that only five years ago a prediction that the U. S. would put a 13.4-pound satellite in orbit about the sun March 3, 1959, would have been labeled by many as "incredible," "fantastic" and "science fiction."

The Army Signal Corps already uses fuel cells to power its portable radar set capable of spotting a single enemy half a mile away. The Silent Sentry, as it is called, can be hidden on the front line, thanks to fuel cells which obviate noisy engine-driven generators.

Fuel cells also have already been used to power an experimental Allis-Chalmers tractor. The tractor can tug a multiple-bottom plow through parched, packed earth with a pull of 3,000 pounds. Fuel cells also have been made to operate an electric saw, a fork-lift truck and welding equipment.

Exactly what is a fuel cell? It is a battery-like device, but it operates on a different principle. It has two electrodes immersed in an electrolyte, a liquid that conducts current. When hydrogen is fed into one electrode and oxygen to the other, a chemical reaction takes place through a

potassium hydroxide electrolyte. Water is formed, but in the process negatively charged electricity accumulates on the hydrogen electrode.

If the cell is not connected to an electric circuit, voltage builds up to about one volt and the reaction stops. If connected to an electric motor, however, a trickle of electricity will flow from the hydrogen electrode through the motor and back to the oxygen electrode. If enough cells are connected in series, so that each adds its strength to the other, enough electricity can be generated to make the motor run. The cells will continue to generate power as long as oxygen and hydrogen gas are supplied.

Oil as Fuel

Other chemicals could be used instead of hydrogen, and considerable research work is now being conducted in this respect. For example, the Esso Research and Engineering Company is understood to be investigating use of oil for a fuel-cell power plant for home basements.

The first practical demonstration of the fuel cell was made in 1959 by British engineer Francis T. Bacon, who has worked on them since 1932. Powering a fork-lift truck, the 2½-kilowatt Bacon fuel cell operates at about 400 degrees Fahrenheit and fuel pressures of 400 to 600 pounds per square inch. Under light load, the fuel cell has an efficiency of about 70%—in brilliant contrast to a high efficiency of about 40% for a sharply engineered steam-electric power plant. Fuel cell efficiencies approaching 100% are theoretically possible.

In the U. S., Research Laboratories of the National Carbon Company (a division of Union Carbide Corporation) have concentrated on developing a fuel cell that operates at room temperature and atmospheric pressure, and that uses air for its oxygen supply. The cell will work on hydrogen gas of commercial purity.

At least 20 American companies are reported to be developing fuel cells for practical applications in everything from onboard motors to space-going satellites.

One of the problems awaiting solution is containing the hydrogen gas in a compact tank. It has been suggested that strong, lightweight, ball-like pressure vessels made of polyester resins and glass fibers, used in some airplanes, might serve to package hydrogen gas.

Liquid hydrogen, vaporized for the fuel cell as needed, also is a possible power package. Although liquid hydrogen has been comparatively scarce, it can be made in large quantities. Recently it was announced that the U. S. is developing a revolutionary new liquid hydrogen and oxygen rocket engine. This suggests that techniques for routine production, cold-storage and handling of liquid hydrogen may soon be at hand.

All of these developments will help draw



NEW POWER PACKAGE—The device being held by Dr. Karl Kordesch of the National Carbon Company is a fuel cell capable of generating electricity when hydrogen and oxygen gases are fed into its special nine hollow, porous carbon electrodes. In operation, the fuel cell is filled with potassium hydroxide. It generates electricity as long as hydrogen and oxygen are fed in, and requires no recharging.

the fuel cell closer to practical everyday applications for the average citizen.

As one group of scientists seeks to improve the fuel cell's inner parts, another group may seek to shrink the fuel cell's size, while still another group may juggle chemicals to find the optimum combination for power production. Another group may compare the several types of fuel cells.

Space scientists, meanwhile, will be developing storage and handling facilities for hydrogen, and suddenly—perhaps in the near future—all the pieces of the puzzle should drop into place.

And presto! your next lawn mower runs on hydrogen. Furthermore you can mow at any hour of the day without acoustically assaulting your neighborhood with putt-putt.

Some visionaries believe the fuel cell is such a promising source of inexpensive electricity that aluminum companies—which require large amounts of power in the electrochemical process of reducing bauxite to aluminum—someday will be clustered about natural gas sources rather than hydroelectric dams.

The reason is that natural gas may be one potentially good fuel for a fuel cell. Generating power via fuel cells in natural gas areas might actually prove to be cheaper than generating it hydroelectrically at big dams—where water to turn the turbines costs nothing!

Science News Letter, January 16, 1960

Questions

ARCHAEOLOGY—What was red sulfide of mercury used for by ancient people? p. 37.

GENETICS—Who are the Nobel Prize winners in medicine for 1959? p. 38.

GEOPHYSICS—How many years back can thermoluminescence date an object? p. 35.

TECHNOLOGY—What is the "silent sentry" used by the Army Signal Corps? p. 42.

Photographs: Cover, Allegheny Ludlum Steel Corporation; p. 35, D. S. Kennedy & Company; p. 37, The University Museum, University of Pennsylvania; p. 39, Chance Vought Aircraft, Inc.; p. 42, National Carbon Company; p. 48, Charles Mathieu & Company.

Do You Know

Introduced commercially less than three years ago, high-density polyethylene achieved a 90,000,000-pound sales volume in 1959 to set a pace as America's fastest growing major plastic in history.

The five major wool exporting countries are Australia, New Zealand, Union of South Africa, Argentina and Uruguay.

Tektites, small chunks of black glass that may come from outer space, have been found in the U. S. only in Texas and Georgia.

The nation's schools received nearly \$67,000,000 worth of surplus foods during fiscal 1959 through the National School Lunch Program.

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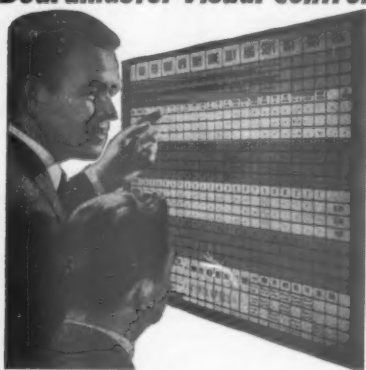
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ELECTRICAL ENGINEERING FOR PROFESSIONAL ENGINEERS' EXAMINATIONS—John D. Constance—*McGraw*, 448 p., \$9.50. Problems and exercises for license candidates.

ENCYCLOPEDIA OF ANIMAL CARE (FORMERLY BLACK'S VETERINARY DICTIONARY)—William C. Miller and Geoffrey P. West—*Williams & Wilkins*, 5th ed., 1056 p., illus., \$9. Completely revised edition.

EVOLUTION AND CHRISTIAN THOUGHT TODAY—Russell L. Mixer, Ed.—*Eerdmans*, 224 p., plates, \$4.50. Re-examination of scriptural data relevant to the question of origin and organic development, by 13 evangelical Christian scientists.

THE FIRST BOOK OF MINING—Patricia Maloney Markun—*Watts*, F., 69 p., illus. by M. Waltrip, \$1.95. Informative story of the mining of metals and coal.

THE GRADUATE SCHOOL AND THE DECLINE OF LIBERAL EDUCATION—Earl J. McGrath—*Teachers College*, 65 p., paper, \$1.50. In the author's opinion, "the liberal arts colleges must free themselves from the dominance of the graduate school."

THE HELICOPTER—Jacob Shapiro—*Macmillan*, 269 p., illus., \$4.50. For the science-minded layman, basic helicopter fundamentals and history.

HOW TO GET THE MOST OUT OF TAPE RECORDING—Lee Sheridan—*Robins Industries*, 128 p., illus., paper, \$1. Helpful hints on the use of recorders, editing and splicing of tapes, and on tape recording and the law.

INTERNATIONAL SYMPOSIUM ON PLASTICS TESTING AND STANDARDIZATION—*Am. Soc. for Testing Materials*, 269 p., illus., \$6. How national standards are achieved and discussion of engineering and thermal properties of plastics.

AN INTRODUCTION TO RADIATION COUNTERS AND DETECTORS—C. C. H. Washell, foreword by A. G. Maddock—*Philosophical Lib.*, 115 p., illus., \$7.50. For the technologist using radioactive measurement techniques.

MAGNETIC AND ELECTRICAL FUNDAMENTALS: Franklinian Approach—Alexander Efron—*Rider*, 124 p., illus., paper, \$2.50. Emphasis is on the physics viewpoint.

THE NATIONAL SCIENCE FOUNDATION AND THE LIFE SCIENCES—Committee on Government Operations, U. S. Senate—*GPO*, 96 p., paper, 30¢. Report on basic research in the biological field.

NATURE AND PROPERTIES OF ENGINEERING MATERIALS—Zbigniew D. Jastrzebski—*Wiley*, 571 p., \$11. Basic knowledge necessary for intelligent selection and use of materials for specific engineering applications.

THE ROCKEFELLER FOUNDATION ANNUAL REPORT 1958: The President's Review including A Quarter Century in the Natural Sciences by Warren Weaver—*The Rockefeller Foundation*, 168 p., illus., paper, free upon request to Foundation, 49 W. 49th St., New York, N. Y.

RUNES: AN INTRODUCTION—Ralph W. V. Elliott—*Philosophical Lib.*, 124 p., 24 plates, \$10. Study of runes in general and of English runic inscriptions in particular.

THE SCATTERING AND DIFFRACTION OF WAVES—Ronold W. P. King and Tai Tsun Wu—*Harvard Univ. Press*, 238 p., diagrams, \$6. Monograph on aspects of diffraction and scat-

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(continued on p. 46)

Resolving the driver-car-road complex

The manner in which vehicles follow each other on a highway is a current subject of theoretical investigation at the General Motors Research Laboratories. These studies in traffic dynamics, coupled with controlled experiments, are leading to new "follow-the-leader" models of vehicle interaction.

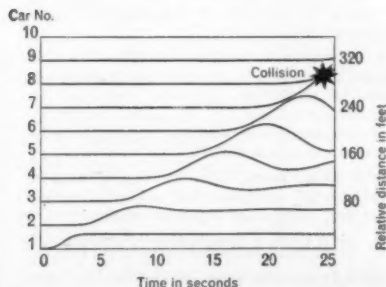
For example, conditions have been derived for the stability of a chain of moving vehicles when the velocity of the lead car suddenly changes — a type of perturbation that has caused multiple collisions on modern superhighways. Theoretical analysis shows that the motion of a chain of cars *can be stable* when a driver accelerates in proportion to the relative velocity between his car and the car ahead. The motion is always unstable when the acceleration is proportional only to the relative distance between cars.

Experimentally, GM Research scientists found that a driver does react mainly to relative velocity rather than to relative distance, with a sensitivity of reaction that increases with decreasing distance.

Traffic dynamics research such as this is adding to our understanding of intricate traffic problems — what causes them, how they can best be resolved. The study is an example of the ways GM Research works to make transportation of the future more efficient and safe.

General Motors Research Laboratories

Warren, Michigan



Relative positions of 10 hypothetical cars after lead car goes through maneuver. Amplitude of instability increases, resulting in a collision between 7th and 8th cars.

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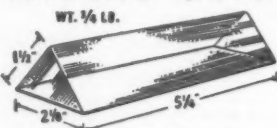
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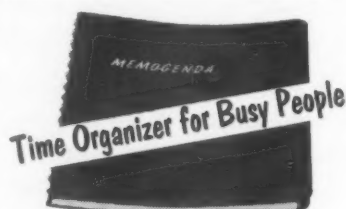
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Books of the Week

(continued from p. 44)

tering of reflections from surfaces of complex shape.

STRESS AND CELLULAR FUNCTION—H. Laborit and others—Lippincott, 235 p., illus., \$7.50. Original French edition was called "Resuscitation: Physio-biological Bases and General Principles."

SYNTHESIS AND ORGANIZATION IN THE BACTERIAL CELL—E. F. Gale—Wiley, 110 p., illus., \$3.50. 1959 CIBA Lectures in Microbial Biochemistry, emphasizes synthesis of proteins and nucleic acids.

TECHNOLOGY AND CULTURE, Vol. I, No. 1, Winter 1959—Melvin Kranzberg, Ed.—Wayne State Univ. Press, 108 p., illus., paper, \$2, quarterly, \$7 a year. New international quarterly of the Society for the History of Technology.

THEORY OF FLIGHT—Richard von Mises with W. Prager and Gustav Kuerti, new introd. by Kurt H. Hohenemser—Dover, 629 p., illus., paper, \$2.85. Reprint of textbook classic.

TURBULENCE: An Introduction to Its Mechanism and Theory—J. O. Hinze—McGraw, 586 p., \$15. Fundamentals of turbulent flows for the chemical engineer.

THE UNITED STATES OF AMERICA: 50-State True Raised Relief Map—Aero Service Corp., 28" x 18", framed, \$9.95. Colorful plastic, three-dimensional wall map, with 4,000 place names, map index and legend. For school, office and home.

WHALE ADVENTURE—Willard Price—Day, 191 p., \$3.50. Boys' experience with a whaling expedition.

THE WORLD BENEATH THE CITY—Robert Daley—Lippincott, 223 p., photographs, \$3.95. The story of New York's water pipes, sewers, subways, gas pipes, underground cable systems, and the men who put them there.

Science News Letter, January 16, 1960

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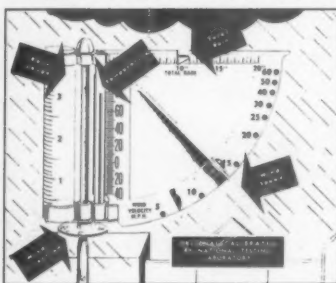
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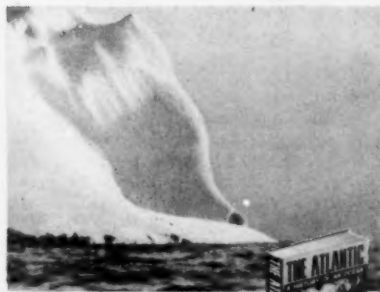
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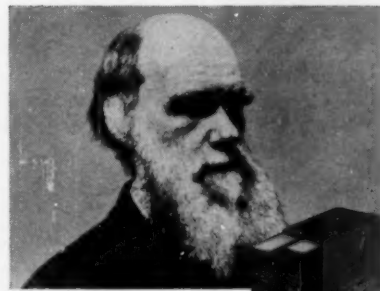
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NUT DRIVER SET consists of five of the most popular sizes of nut drivers, with plastic handles of different colors for quick identification. They are contained in a two-tone transparent plastic case.

Science News Letter, January 16, 1960

BUSINESS CARDS, slightly larger than the regular size, carry the normal company imprint. But across the top is printed, "Wet Card. When Dry, Wet Again." On wetting the card, a business slogan or advertisement will show up on the back. When the card dries, the message disappears and the card may be used over and over again.

Science News Letter, January 16, 1960

POWER-DRIVEN HAMMER not only drives in nails and tacks with one sure blow, but automatically feeds and holds them in place prior to the impact. The hammer is claimed to enable furniture manufacturers to increase production and incorporate crating operations on the end of assembly lines.

Science News Letter, January 16, 1960

FACIAL TISSUE DISPENSER of hand-polished clear plastic, shown in the photograph, has a circular "pop-up" opening in a floating lid. Available with special mono-



grams, the unit holds up to 400 interfolded tissues of any make. Since the entire supply is visible through the clear plastic, you can always see how many are left.

Science News Letter, January 16, 1960

LAWN SPREADER of plastic has a capacity of more than 25 pounds and may be used to seed, weed and feed your lawn. A calibrated non-slip flow control adjustment

may be set to release the exact amount of fertilizer, seed or weed killer.

Science News Letter, January 16, 1960

SHORT-CIRCUIT FINDER for locating shorts in autos consists of a three-by-five-by-six-inch steel case, a dialed detector, and two leads 24 inches long equipped with insulated alligator clips. When the detector comes within an inch or so of the short, the flipping dial ceases to register and the short is pinpointed.

Science News Letter, January 16, 1960

PORTABLE PLANETARIUM may be used indoors to teach names, locations, appearance and relative positions of all major constellations in our latitudes, and outdoors as a star finder. Adjustable for any hour of any day of any month, the planetarium also includes the mythical constellation configurations, compass points for viewing direction, light bulb, batteries and instructions.

Science News Letter, January 16, 1960

SHRUBBERY RAKE for removing leaves, twigs and cuttings from flower beds and around shrubs is seven and a half inches wide and light in weight. Six flat spring-steel tines are oil tempered for resilience and wear resistance.

Science News Letter, January 16, 1960



Nature Ramblings



By BENITA TALL

NOW IN MIDWINTER, with snow covering much of the land, trees stripped bare of their leaves and little plant life to be seen, it might seem premature to talk of seeds. Yet it is certainly not.

Seeds, actually miniature plants complete with a protective covering and a food supply to last until "the time" has come, are resting in the cold earth. They are now in a kind of midway point in their lives. In the spring all the food will be needed as conditions become favorable and the time does come for germination and growth. The resting period of wintertime is not all in preparation for spring, however. An equally energetic and busy time ended as the seed touched soil not many months ago.

We know how cultivated seeds reach their destination: placed in the soil by man or ingeniously designed machines. Nature, however, exceeds man in the many ways seed dispersal is insured.

They are jet-propelled, carried by water,

Propulsion for Posterity



air, or outside—or inside—animals. Some seeds are relatively simple structures like the wild rose's, others are complicated with "propeller blades" (maple trees), parachute-like arrangements (milkweeds), or barbs (cocklebur).

The wild geranium virtually jet propels its seeds, scattering them far from the parent plant.

The seed pod of this plant is made up of five strap-shaped sections firmly attached

to the top of a central core and sealed along their edges. At the bottom of each section is a cup holding the seed. "Launching" occurs when atmospheric conditions are right and the seeds are ripe. The five sections break loose from the central core and violently fling their cup ends upward and outward. The seeds are thus tossed far away.

In another group of plants that includes the swamp mallow and jimson-weed, the seed pod splits open at the top. The plant is dependent upon the wind to shake its stem, throwing out the seeds. The poppy, with its openings at the top of the pod, is another plant that needs the wind for seed propulsion.

The millions of seeds which almost literally flood the land in autumn and early winter are a placid, underground reservoir of plant life. Not too many months from now, the cycle will begin again: Germination, growth, reproduction, seed dispersal and dormancy.

Science News Letter, January 16, 1960